IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 09/886,055	Confirmation No. :
Applicant	: LUBERT STRYER, et al.	
Filed	: June 22, 2001	
TC/A.U.	:	
Examiner	:	
Docket No.	: 100337.54258US	
Customer No.	: 23911	
Title	: RECEPTOR FINGERPRINTING, SENSORY PERCEPTION, AND BIOSENSORS OF CHEMICAL SENSANTS	

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellants herein respectfully appeal the final rejection of claims 23-36 pursuant to 37 C.F.R. § 1.191. The requisite fee for a small entity of $165.00 as set forth in § 41.20(b)(1) accompanies this Brief.

Real Party in Interest

The real party in interest is Senomyx Incorporated, a corporation located in La Jolla, California and incorporated in Delaware.

Related Appeals or Interferences

There are no related appeals or interferences known to Appellants.

Status of Claims

Claims 23-36 remain pending. Claims 23-36 stand finally rejected and are appealed herein. Claims 24 and 34-36 allegedly stand withdrawn from

consideration as allegedly being directed to an invention distinct from the originally elected invention. However, notwithstanding this assertion the PTOL 326 indicates that these claims were examined and are included in the claims finally rejected. Likewise the Final Rejection includes these claims in the listing of claims which stand finally rejected. Assuming for the sake of argument that these claims are withdrawn from consideration and were not intended to be included in the rejection, Appellants respectfully submit for the reasons set forth herein that the position of the Examiner is erroneous. In fact these claims further limit claim 23 from which they ultimately depend and are directed to the same elected invention which is to a method for representing sensory perception elicited by one or more odorants using a representative class of different olfactory receptors wherein at least one of the olfactory receptors within this representative class has the sequence contained in SEQ ID NO:55 which is encoded by the sequence contained in SEQ ID NO:56. The claims which allegedly are improperly withdrawn from consideration (as noted above, this is unclear from the PTOL 326 and the statement of the obviousness rejection in the Final Office Action) merely require and further limit claim 23 by providing for the representative class n of olfactory receptors to be selected from and to include the specific human olfactory receptors which are disclosed in this patent application consistent with the originally presented claims as well as the originally elected and examined invention of Group I, claims 1-11.

Status of Amendments

No amendments pursuant to 37 C.F.R. § 1.116 have been submitted in this application. The only amendment in this application was an Amendment submitted on October 27, 2005 which cancelled then-pending claims 1-22 (including all of then elected claims 1-11 and non-elected claims 12-22) in favor of new claims 23-36. This Amendment was entered in its entirety. However, as discussed infra, Appellants respectfully submit that the Examiner may have improperly withdrawn Claims 34-36 from examination as allegedly being directed to an invention distinct from that elected for purposes of examination. In fact Claims 34-36 directly correspond to the invention of originally elected Group I, claims 1-11, which is directed to a method of representing sensory perception elicited by a representative class n of olfactory ligands wherein at least one member of this class is the human olfactory receptor contained in SEQ ID NO:55. Indeed, Claims 34-36 merely provide for the other members of the representative class to include some or all of the other human olfactory receptors disclosed in this application , which is entirely consistent with the elected invention as well as the originally examined claims 1-11.

Summary of Claimed Subject Matter

The only independent is Claim 23. The claimed subject matter of claim 23 is directed to a method of representing sensory perception of one or more odorants comprising:

(a) providing a representative class of n olfactory receptors or ligand

binding domains thereof wherein at least one member of the class comprises the human olfactory receptor contained in SEQ ID NO:55;

(b) measuring Xi to Xn representative of at least one activity of the one or more odorants selected from the group consisting of binding of the one or more odorants to the ligand-binding domain of at least one of the n olfactory receptors with the one or more odorants; and

(c) generating a representation of sensory perception from the values Xi to Xn.

The dependent claims provide for the representative group of olfactory receptors which includes SEQ ID NO:55 to include other human olfactory receptors (claims 24, and 34-36) for the assay to screen for at least 2 activities (claim 25), for the receptors to be expressed on a cell at identifiable locations (claim 26) for the binding assays to be effected in solution or solid state (claims 27-28), for the binding determination to be based on specific threshold values (claim 29, 31), for the assay to use specific detection means used for GPCR assays (claim 30), for the assay to detect a reduction in binding or activation of the receptor array by at least one odorant (claim 32) and for the assay to generate a neural network that represents sensory perception elicited by the at least one olfactant or odorant (claim 33). As noted, notwithstanding the Examiner's indication to the contrary all of these claims are directed to a unitary invention which corresponds to the same invention elected in the Response submitted by

Applicants on March 16, 2004.

Grounds of Rejection

The only ground of rejection is a rejection under 35 U.S.C. 103 of Claims

23-36 based on Krautwurst et al., Cell 1998 in view of Burford et al., US

published patent application No. 2004/0224314. Essentially, the Examiner

concludes that the primary reference, Krautwurst et al., teaches all aspects of

the claimed invention as set forth in claims 23-26 which is directed to a method

of representing sensory perception elected by at least one odorant by an activity

asay which screens at least for binding of said at least one odorant to a

representative class of olfactory receptors including n members, and may include

other activity assays as set forth in all of the claims which are dependent on

claim 23 with the exception that the primary reference Krautwurst fails to teach

such an assay effected using an array of olfactory receptors wherein at least one

of the members contains the amino acid sequence in SEQ ID NO-55 which is

encoded by the nucleic acid sequence contained in SEQ ID NO:56. However, the

Examiner concludes that this conceded deficiency of the primary reference is

cured by the secondary reference Burford et al. "which teach SEQ ID NOs 55 and

56 (see SEQ ID Nos 27 and 66 respectively as well as the attached alignments)".

This rejection is respectfully submitted to be improper.

Arguments

Appellants respectfully submit that the only rejection which is an obviousness rejection of claims 23-36 or an obviousness rejection of claims 23 and 25-33 (assuming that claims 24 and 34-36 do not stand rejected but rather are withdrawn from consideration as being directed to a non-elected invention) is improper and should be withdrawn since the rejection is based on improper hindsight since it is not predicated upon the subject matter which is disclosed in the cited references alone or in combination or upon information which would have been suggested to one skilled in the art based upon the information disclosed in these references and what was then known in the art. In particular, the rejection is improper since it relies upon the identification of SEQ ID NO:55 as encoding a human olfactory receptor and based thereon its usage in an olfaction perception assay as claimed herein.. However, this information is not disclosed in either of the references relied upon the Examiner which allegedly render obvious the claims on appeal herein. Absent this explicit teaching or recognition, there would not have existed the requisite incentive to use SEQ ID NO-55 in an assay for representing sensory perception elicited by one or more olfactants which assay uses an array of representative olfactory receptors wherein at least one of the class has the sequence contained in SEQ ID NO:55.

For the purposes of this Appeal Appellants will concede for the sake of argument that Krautwurst discloses a method having all the steps as set forth in claims 23-26 with the exception of failing to teach or suggest any sensory assay

that uses a set of olfactory receptors at least one of which is an olfactory receptor as set forth in SEQ ID NO:55. For this reason this reference at least taken alone fails to teach or suggest the invention.

The deficiencies of Krautwurst are not cured by Burford. As properly indicated by the Examiner, the Burford patent application teaches a number of different G protein coupled receptor sequences including a sequence that appears to correspond to SEQ ID NO:55. However, this patent application reference fails to teach or suggest the use of this sequence in a sensory assay as set forth in claims 23-36 which screens this receptor as a member of a class of representative olfactory receptor sequences against one or more odorants in order to assess the sensory perception elicited by said one or more odorants.

Additionally, this usage is further not obvious from the teachings of Burford which fail to teach or identify SEQ ID NO-55 as encoding a human olfactory receptor. In fact the Examiner seems to acknowledge this deficiency of but alleges that it would have been obvious since Burford mentions that the largest subfamily of GPCRs is the group that constitutes the olfactory receptors. The Burford reference notes that these receptors function by transducing odorant signals. Based on this statement the Examiner concludes that it would have been obvious to have utilized the GPCR sequence disclosed by Burford et al in the odorant sensory perception assay disclosed by Krautwurst. However, the position of the Examiner is respectfully traversed.

Absent an explicit recognition that the elected sequence encodes a human olfactory receptor it would not have been obvious to have utilized such sequence in a sensory perception assay as claimed herein which screens one or more odorants in binding assays against a representative sample of human olfactory receptors including SEQ ID NO:55. In particular while the Examiner is correct in her assertion that olfactory receptors constitute a large subfamily of GPCRs, this does not mean that it is reasonable to assume based on this fact that a GPCR of uncharacterized function will encode an olfactory receptor. Nor is it reasonable to conclude that it would be obvious to utilize such a sequence in an olfactory assay as claimed herein. To the contrary, GPCRs constitute a huge group which includes thousands of different genes which are involved in a myriad of different cellular functions and signaling events with only one of these functions being olfaction.

Also, the Examiner's reliance on In re Best 195 USPQ 430, 1997 in the Office Action is misplaced. The Examiner cites this case for the premise that the burden is on an Applicant to establish that products which appear to inherently be the same are not. This burden is placed on Applicants since the Patent Office does not have the resources to conduct comparative assays.

However, this case is not germane to the facts herein. Appellants are not claiming a product which is identical to that disclosed in the prior art. To the contrary Appellants are claiming a detection method which screens an array of different olfactory receptors including the elected human olfactory sequence

contained in SEQ ID NO:55. The subject claims which stand finally rejected are not directed to a nucleic acid sequence or polypeptide encoded thereby. In fact, as disclosed in the background of this application the subject invention instead relates to sensory perception assays which utilize human olfactory receptors which are claimed in an earlier patent application. Thus the reliance on In re Best is not appropriate to the facts at hand.

For the foregoing reasons Appellants respectfully submit that all of the Claims on appeal are patentable over Krautwurst et al. in view of Burford et al., which references alone or in combination fail to teach or suggest sensory perception assays which screen a set of human olfactory receptors at least one of which contains the sequence in SEQ ID NO:55 in binding assays against one or more odorant molecules and thereby identifies the sensory profile thereof.

Also, Appellants separately argue the patentability of claims 24 and 34-36. As disclosed in the subject application the subject sensory perception assay uses a set of human olfactory receptors selected from the sequences recited in Claim 24. Claims 34-36 further limit claim 24 by specifying that the set of olfactory receptors includes a certain number (respectively at least 50, 100 or 200 of the genes recited in Claim 24). The Final Rejection purports that these claims stand withdrawn from consideration on the basis that they are directed to a non-elected invention. However, in fact these claims are listed on the PTOL-326 as being included in the rejection. Additionally, these claims are included in the statement of the obviousness rejection. In fact these claims properly should be

included in the examined claims since they further limit the only independent claim 23 because they provide for the set of screened olfactory sequences (including elected SEQ ID NO:55) to include other human olfactory sequences disclosed in this application. Indeed this is consistent with the invention as set forth in originally elected Claims 1-11. Again it would appear that the Examiner is confused in that she is applying the restriction rules as if Appellants were claiming sequences rather than sensory assays which utilize a representative set of olfactory sequences including SEQ ID NO:55. Indeed to restrict Claims 24, and claims 34-36 from the invention as set forth in Claim 23 is improper since these claims in fact further limit and define the set of sequences used in Claim 23. Appellants further respectfully submit that the Krautwurst and Burford references alone or in combination fail to teach or suggest olfactory sensory perception assays as claimed using the specific set of sequences recited in claims 24 and 34-36.

CONCLUSION

Based on the foregoing Appellants respectfully submit that the obviousness rejection of Claims 23-36 is unsustainable because the Krautwurst and Burford references alone or in combination fail to teach or suggest sensory perception assays which screens a set of human olfactory receptors at least of one contains the sequence in SEQ ID NO:55 in binding assays which screen against one or more odorant molecules in order to determine the sensory profile elicited thereby. Accordingly, Appellants respectfully request reversal of the outstanding

103 rejection of claims 23-36 and allowance of this application. A Decision to

that effect is respectfully solicited.

Respectfully submitted,

HUNTON & WILLIAMS LLP

Dated: <u>May 15, 2006</u>   By:_____
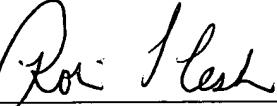
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RLT:ast

Claims Appendix

Pursuant to § 41-37(c)(1)(vii), a clean copy of all the claims on appeal in this application is set forth below:

1-22 (Cancelled)

23. Previously submitted) A method for representing sensory perception of one or more odorants comprising:

(a) providing a representative class of n olfactory receptors or ligand-binding domains thereof;

(b) measuring X_1 to X_n representative of at least one activity of the one or more odorants selected from the group consisting of binding of the one or more odorants to the ligand-binding domain of at least one of the n olfactory receptors, activating at least one of the n olfactory receptors with the one or more odorants, and blocking at least one of the n olfactory receptors with the one or more odorants: and

(c) generating a representation of sensory perception from the values X_1 to X_n

wherein at least one of the n olfactory receptors has the amino acid sequence contained in SEQ ID NO: 55.

24. Previously submitted) The method of Claim 23, wherein between 5 and 350 olfactory receptors are used in said screening method and said receptors are selected from the amino acid sequences contained in SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO: 11, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO: 17, SEQ ID NO:19, SEQ ID NO:21, SEQ ID

NO:23, SEQ ID NO:25, SEQ ID NO:27, SEQ ID NO: 29, SEQ ID NO: 31, SEQ ID

NO:33, SEQ ID: 35, SEQ ID NO:37, SEQ ID NO: 39, SEQ ID NO:41, SEQ ID NO:

43, SEQ ID NO:45, SEQ ID NO:47, SEQ ID NO:49, SEQ ID NO:51, SEQ ID

NO:53, SEQ ID NO: 55, SEQ ID: NO: 57, SEQ ID NO:59, SEQ ID NO: 61, SEQ

ID NO:63, SEQ ID NO: 65, SEQ ID NO 67, SEQ ID NO:69, SEQ ID NO:71, SEQ

ID NO 73, SEQ ID NO:75, SEQ ID NO: 77, SEQ ID NO: 79, SEQ ID NO:81, SEQ

ID NO:83, SEQ ID NO:85, SEQ ID NO: 87, SEQ ID NO:89, SEQ ID NO:91, SEQ

ID NO:93, SEQ ID NO:95, SEQ ID NO:97, SEQ ID NO:99, SEQ ID NO:101, SEQ

ID NO:103, SEQ ID NO:105, SEQ ID NO:107, SEQ ID NO:109, SEQ ID NO:111,

SEQ ID NO:113, SEQ ID NO:115, SEQ ID NO:117, SEQ ID NO:119, SEQ ID

NO:121, SEQ ID NO:123, SEQ ID NO:125, SEQ ID NO:127, SEQ ID NO:129,

SEQ ID NO:131, SEQ ID NO:133, SEQ ID NO:135, SEQ ID NO:137, SEQ ID

NO:139, SEQ ID NO:141, SEQ ID NO:143, SEQ ID NO:145, SEQ ID NO:147,

SEQ ID NO:149, SEQ ID NO:151, SEQ ID NO:153, SEQ ID NO:155, SEQ ID

NO:157, SEQ ID NO:159, SEQ ID NO:161, SEQ ID NO:163, SEQ ID NO:165,

SEQ ID NO:167, SEQ ID NO:169, SEQ ID NO:171, SEQ ID NO:173, SEQ ID

NO:175, SEQ ID NO:177, SEQ ID NO:179, SEQ ID NO:181, SEQ ID NO:183,

SEQ ID NO:185, SEQ ID NO:187, SEQ ID NO:189, SEQ ID NO:191, SEQ ID

NO:193, SEQ ID NO:195, SEQ ID NO :197 SEQ ID NO:199, SEQ ID NO:201,

SEQ ID NO: 203, SEQ ID NO:205, SEQ ID NO:207, SEQ ID NO:209, SEQ ID

NO:211, SEQ ID NO:213, SEQ ID NO:215, SEQ ID NO:217, SEQ ID NO:219,

SEQ ID NO:221, SEQ ID NO:223, SEQ ID NO:225, SEQ ID NO:227, SEQ ID

NO:229, SEQ ID NO:231, SEQ ID NO:233, SEQ ID NO:235, SEQ ID NO:237,

SEQ ID NO:239, SEQ ID NO:241, SEQ ID NO:243, SEQ ID NO:245, SEQ ID

NO:247, SEQ ID NO:249, SEQ ID NO:251, SEQ ID NO:253, SEQ ID NO:255,

SEQ ID NO:257, SEQ ID NO:259, SEQ ID NO:261, SEQ ID NO:263, SEQ ID

NO:265, SEQ ID NO:267, SEQ ID NO:269, SEQ ID NO:271, SEQ ID NO:273,

SEQ ID NO:275, SEQ ID NO:277, SEQ ID NO:279, SEQ ID NO:281, SEQ ID

NO:283, SEQ ID NO:285, SEQ ID:287, SEQ ID NO:289, SEQ ID NO:291, SEQ

ID NO:293, SEQ ID NO:295, SEQ ID NO:297, SEQ ID NO:299, SEQ ID NO:301,

SEQ ID NO:303, SEQ ID NO:305, SEQ ID NO:307, SEQ ID NO:309, SEQ ID

NO:311, SEQ ID NO:313, SEQ ID NO:315, SEQ ID NO:317, SEQ ID NO:319,

SEQ ID NO:321, SEQ ID NO:323, SEQ ID NO:325, SEQ ID NO:327, SEQ ID

NO:329, SEQ ID NO:331, SEQ ID NO:333, SEQ ID NO:335, SEQ ID NO:337,

SEQ ID NO:339, SEQ ID NO:341, SEQ ID NO:343, SEQ ID NO:345, SEQ ID

NO:347, SEQ ID NO:349, SEQ ID NO:351, SEQ ID NO:353, SEQ ID NO:355,

SEQ ID NO:357, SEQ ID NO:359, SEQ ID NO:361, SEQ ID NO:363, SEQ ID

NO:365, SEQ ID NO:367, SEQ ID NO:369, SEQ ID NO:371, SEQ ID NO:373,

SEQ ID NO:375, SEQ ID NO:377, SEQ ID NO:379, SEQ ID NO:381, SEQ ID

NO:383, SEQ ID NO:385, SEQ ID:387, SEQ ID NO:389, SEQ ID NO:391, SEQ

ID NO:393, SEQ ID NO:395, SEQ ID NO:397, SEQ ID NO:399, SEQ ID NO:401,

SEQ ID NO:403, SEQ ID NO:405, SEQ ID NO:407, SEQ ID NO:409, SEQ ID

NO:411, SEQ ID NO:413, SEQ ID NO415, SEQ ID NO:417, SEQ ID NO:419,

SEQ ID NO:421, SEQ ID NO:423, SEQ ID NO:425, SEQ ID NO:427, SEQ ID

NO:429, SEQ ID NO:431, SEQ ID NO:433, SEQ ID NO:435, SEQ ID NO:437,

SEQ ID NO:439, SEQ ID NO:441, SEQ ID NO:443, SEQ ID NO:445, SEQ ID

NO:447, SEQ ID NO:449, SEQ ID NO:451, SEQ ID NO:453, SEQ ID NO:455, SEQ ID NO:457, SEQ ID NO:459, SEQ ID NO:461, SEQ ID NO:463, SEQ ID NO:465, SEQ ID NO:467, SEQ ID NO:469, SEQ ID NO:471, SEQ ID NO:473, SEQ ID NO:475, SEQ ID NO:477, SEQ ID NO:479, SEQ ID NO:481, SEQ ID NO:483, SEQ ID NO:485, SEQ ID NO:487, SEQ ID NO:489, SEQ ID NO:491, SEQ ID NO:493, SEQ ID NO:495, SEQ ID NO:497, SEQ ID NO:499, SEQ ID NO:501, SEQ ID NO:503, SEQ ID NO:505, SEQ ID NO:507, SEQ ID NO:509, and SEQ ID NO:511..

25. Previously submitted) The method of Claim 23 wherein at least two different activities are measured to provide the values X_1 to X_n.

26. Previously submitted) The method of Claim 23 wherein said odorant receptor is expressed in cells and the cells expressing each odorant receptor are located at an identifiable position.

27. Previously submitted) The method of Claim 23 wherein said at least one olfactory receptor is soluble and binding of said odorant to a ligand-binding domain of the soluble olfactory receptor is measured in solution.

28. Previously submitted) The method of Claim 23 wherein said at least one olfactory receptor is in solid state and binding of odorant to a ligand-binding domain of the solid-state olfactory receptor is measured on a substrate.

29. Previously submitted) The method of Claim 23 wherein the value measured for binding is above a preset limit for specific binding to olfactory receptors.

30.   Previously submitted) The method of Claim 23 wherein the value measured for activating said receptor is derived from a signal selected from the group consisting of intracellular Ca^{2+}, cAMP, cGMP and IP3.

31.   Previously submitted) The method of Claim 23 wherein the value measured for activating an olfactory receptor is above a preset limit for specific activation.

32.   Previously submitted) The method of claim 23 wherein the value measured for blocking an olfactory receptor is at least a reduction in binding of the odorant or activation by the odorant.

33.   Previously submitted) The method of Claim 23 wherein the representation of sensory perception is generated with a neural network.

34.   Previously submitted) The method of claim 24 which comprises using at least 50 of said olfactory sequences.

35.   Previously submitted) The method of claim 23 which comprises using at least 100 of said olfactory sequences.

36.   (Previously Submitted) The method of claim 23 which comprises using at least 200 of said olfactory sequences.